

### AMENDMENTS TO THE CLAIMS

1-96. (Canceled)

97. (New) A method of processing a cell population that comprises adipose-derived stem cells for reintroduction into a patient, comprising:

removing adipose tissue that comprises adipose-derived stem cells from said patient;

introducing the removed adipose tissue into a self-contained cell processing unit configured to maintain a closed pathway;

separating said cell population that comprises adipose-derived stem cells from mature adipocytes and connective tissue present in the adipose tissue that was removed from said patient such that said mature adipocytes and said connective tissue are substantially separated from said cell population that comprises adipose-derived stem cells within said self-contained cell processing unit while maintaining said closed pathway;

concentrating said cell population that comprises adipose-derived stem cells with said self-contained cell processing unit while maintaining said closed pathway;

cooling said concentrated cell population that comprises adipose-derived stem cells within said self-contained processing unit while maintaining said closed pathway; and

reintroducing said concentrated cell population that comprises adipose-derived stem cells into said patient.

98. (New) The method of Claim 97, wherein said concentrated cell population that comprises adipose derived stem cells is reintroduced into said patient while maintaining a closed pathway.

99. (New) The method of Claim 97, wherein said adipose tissue that is removed from said patient is lipoaspirate.

100. (New) The method of Claim 97, wherein said adipose tissue that is removed from said patient is obtained by excisional lipectomy.

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101. (New) The method of Claim 97, wherein said concentrated cell population comprising adipose-derived stem cells is reintroduced into said patient subcutaneously, intravenously, intramuscularly, or intraperitoneally.

102. (New) The method of Claim 97, further comprising a disaggregation step, wherein said cell population comprising adipose-derived stem cells contained in the removed adipose tissue is mechanically or enzymatically disaggregated from said mature adipocytes and connective tissue present in the adipose tissue that was removed from said patient prior to separation.

103. (New) The method of Claim 97, wherein said cell population comprising said adipose-derived stem cells is separated from said mature adipocytes and connective tissue present in the adipose tissue that was removed from said patient by employing a filter.

104. (New) The method of Claim 103, wherein said filter is a spinning membrane filter.

105. (New) The method of Claim 103, wherein said filter comprises an antibody.

106. (New) The method of Claim 105, wherein said antibody is selected from the group consisting of AP2, CD3, CD19, and CD11b.

107. (New) The method of Claim 97, wherein said cell population comprising said adipose-derived stem cells is separated from said mature adipocytes and connective tissue present in the adipose tissue that was removed from said patient by centrifugation.

108. (New) The method of Claim 102, wherein said disaggregation step comprises an enzymatic digestion.

109. (New) The method of Claim 108, wherein said enzymatic digestion comprises a collagenase.

110. (New) The method of Claim 108, wherein said enzymatic digestion comprises a neutral protease.

111. (New) The method of Claim 108, wherein said enzymatic digestion comprises trypsin.

112. (New) The method of Claim 97, wherein said adipose-derived stem cells in said concentrated cell population that comprises adipose-derived stem cells are at least 0.1% of the cellular component.

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113. (New) The method of Claim 97, wherein said adipose-derived stem cells in said concentrated cell population that comprises adipose-derived stem cells are between about 2% and about 12% of the cellular component.

114. (New) The method of Claim 97, wherein said adipose tissue removed from said patient that comprises adipose-derived stem cells has a concentration of about  $2 \times 10^7$  adipose-derived stem cells/100ml adipose tissue.

115. (New) The method of Claim 97, wherein said concentrated cell population that comprises adipose-derived stem cells comprises endothelial precursor cells.

116. (New) The method of Claim 97, wherein said patient has a disease or injury selected from the group consisting of slow/non-union fractures, osteoporosis, osteogenesis imperfecta, liver failure, hepatitis B, hepatitis C, myocardial infarction, renal disease, retinal disease, ulcers, muscle disorders, cartilage disorder, lung disease, diabetes, intestinal disorder, central nervous system disorder, spinal cord injury, Parkinson's disease, Alzheimer's disease, chronic heart disease, and stroke.

117. (New) The method of Claim 97, wherein said patient has wrinkles, divots, or pockmarks.

118. (New) The method of Claim 97, wherein said patient has liver injury.

119. (New) The method of Claim 118, further comprising measuring liver regeneration.

120. (New) The method of Claim 97, further comprising removing a portion of said cooled, concentrated cell population that comprises adipose-derived stem cells from said self-contained cell processing unit.

121. (New) The method of Claim 120, wherein said cooled, concentrated cell population that comprises adipose-derived stem cells that is removed from said self-contained cell processing unit is cryopreserved.

122. (New) The method of Claim 97, further comprising providing an additive to said concentrated cell population comprising adipose-derived stem cells or said patient.

123. (New) The method of Claim 122, wherein said additive is a tissue or tissue fragment.

124. (New) The method of Claim 122, wherein said additive is demineralized bone.

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125. (New) The method of Claim 122, wherein said additive is a compound of the thiaglitazone family.

126. (New) The method of Claim 122, wherein said additive is insulin.

127. (New) The method of Claim 122, wherein said additive is an exogenous DNA.

128. (New) The method of Claim 122, wherein said additive is a biological or artificial scaffold.

129. (New) The method of Claim 128, wherein said biological or artificial scaffold is a resorbable plastic sheath.

130. (New) The method of Claim 122, wherein said additive is an immunosuppressive agent.

131. (New) The method of Claim 130, wherein said immunosuppressive agent is selected from the group consisting of cyclosporine, myophenylate mofetil, rapamycin, and antithymocyte globulin.

132. (New) The method of Claim 122, wherein said additive is a cell differentiation agent.

133. (New) The method of Claim 132, wherein said cell differentiation agent is a cytokine.

134. (New) The method of Claim 132, wherein said cell differentiation agent is a growth factor.

135. (New) The method of Claim 122, wherein said additive is an antimicrobial agent.